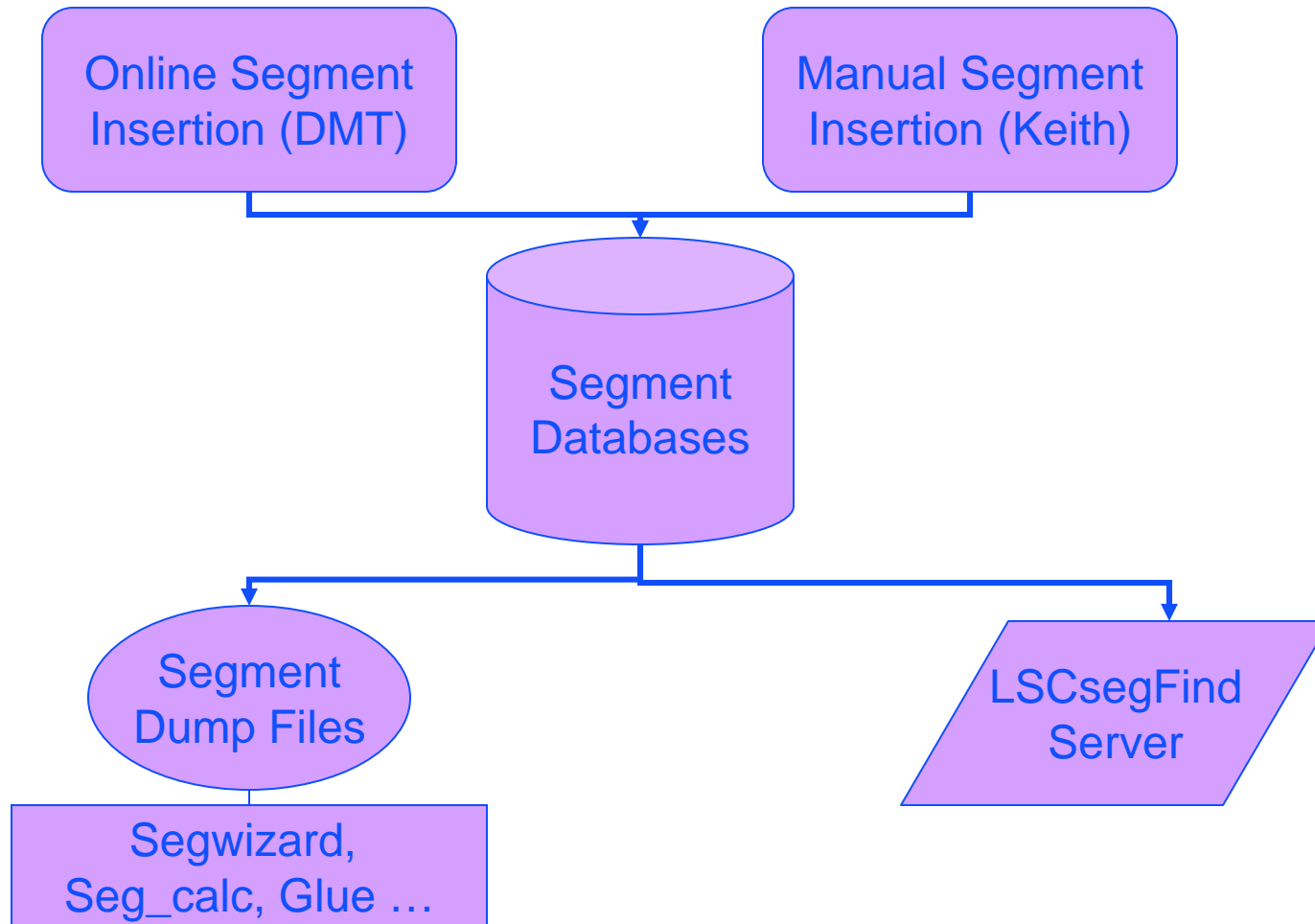


# S5 Data Quality Update

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# Data Quality Database



# Segment Database

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- Segment Versions (newish)
  - » Version model changed
    - Each new version completely shadows previous
    - Copy of most recent version labeled v99 in segment dumps
    - First new version labeled v10.
  - » Segment versions accessible from LSCsegFind
    - Most recent version by default

# Data Quality Segments

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- Generating segments is a large, continuing effort:
  - » ~126 flag types contributed by ~23 members of Detector Characterization group.
- All segment types and their valid times are described in page maintained by Keith at:  
<http://gallatin.physics.lsa.umich.edu/~keithr/S5DQ/flaginfo.html>
- Usual provisos:
  - » No implied recommendation
  - » Make sure you understand the segments before using them as vetoes
  - » Test for safety in you search.

# Segments Updated Since October 2007

- NO\_CALIB\_LINE: Calib line injections turned off
- CALIB\_DROPOUT\_xxx: Calib line dropouts
- H1:SIDE\_COIL\_ETM[XY]\_RMS\_6HZ: ETM side coil motion in the 6-Hz region
- H[12]:TCS\_GLITCH\_LOUD: TCS glitch segments based on kleineWelle trigs.
- POWMAG: powermains glitches seen in multiple magnetometers.
- H[12]:H[21]\_LOCKLOSS/LOCKGAIN: Interferometer transition in/out of lock
- H[12]:COSMIC\_RAY: LHO cosmic ray showers
- H1:SEISMIC\_EY\_99PCTL\_3\_10HZ: 99 percentile End-y seismic noise (3-10Hz)
- OUT\_OF\_LOCK: IFO not in lock - PRE\_LOCKLOSS\_nn\_SEC: Times before lockloss
- LIGHTDIP\_nn\_PERCENT: Light dips in x,y -arm QPDs.
- MASTER\_OVERFLOW\_{ASC,LSC,SUS\_MC2, SUS\_RM, IOO}: FE overflow flags.
- TIDAL\_SERVO\_{PRE,DE}SATURATION: Tidal servo reaches/leaves end of range.
- AS\_TRIGGER: ASPD5 triggered in science mode.
- POWERMAINS\_{DISRUPTION, GLITCH}: LHO power transients.
- INVALID\_DARMERR: Readout errors on DARM\_ERR
- H1:DARM\_II\_hh\_dHz\_{LOW,MED,HIGH}THRESH: Noise near susp. resonances
- XXX\_GLITCHINESS: glitchy epochs based on inspiral range dips.

# DQ flags revised since 10/07

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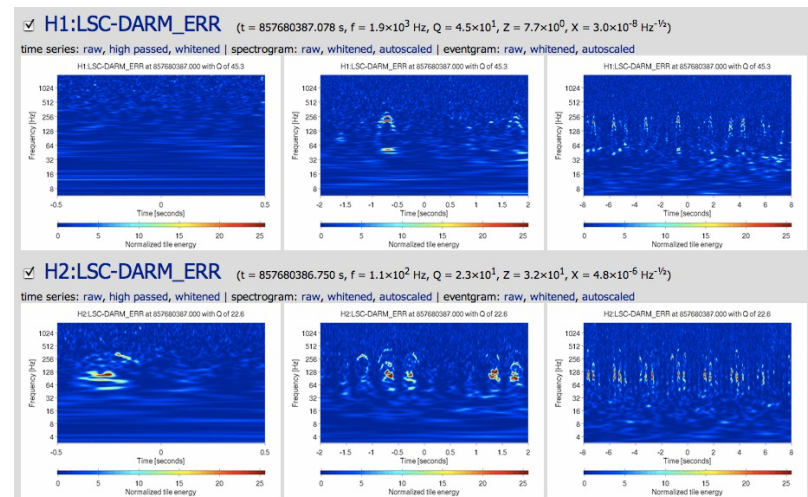
- `Wind_Over_30MPH`: Remove weather station glitches (250MPH)
- `SIDECOIL_ETM[XY]_RMS_6HZ`: Use triggers (5s granularity instead of 60s)

# New DQ flags

- MISSING\_RDS\_C03\_L[12X]: h(t) data missing
- PHOTODIODE\_{GLITCH,OFF}: Strange AS port photodiode behavior.
- SEISMIC\_[XY]\_30\_100\_mHz\_{LOW,MED,HIGH}THRESH: Earthquake detection.
- BN\_GLITCHINESS glitchy period seen in Block-Normal
- CORRUPTED\_RDS\_C03\_LX: Corrupter h(t) for V3 calibration.
- ISCT10\_TABLE\_GLITCH: H2 dark port table accelerometer glitches
- L1:BS\_OPTLEVER: Beam-splitter optical lever glitches.
- PULSAR\_INJECTION\_xxxx: Pulsar injection type flags
- PEM\_INJECTION: PEM injection not marked in state vector.
- L1:BS\_OPTLEVER\_HIGHRMS: Gain peaking at 3.6 Hz in BS optical lever servo.
- L1:BSOPLEV\_3p6HZOSCILLATIONS, L1:EX\_LOGGING, L1:LVEA\_NOISY, L1:MOVED\_LVEA\_SEIS, L1:RAILED\_RBS\_PZT, L1:SEC\_LOGGING: New flags based on hand-scan of epochs with large variations in range. (Gaby Gonzalez)
- **H1: COIL\_UPCONVERSION**: Intervals where the band-limited RMS current in the H1 end-Y coils at low frequencies is excessively high, leading to up-conversion. (Masahiro Ito)
- **H1H2\_SCATTERING**: Potential fringe-wrapping light scattering between H1 and H2 based on excess power in 1-4 Hz of either interferometer's DARM\_CTRL channel. (Robert Schofield)

# H1-H2 Fringe Wrapping

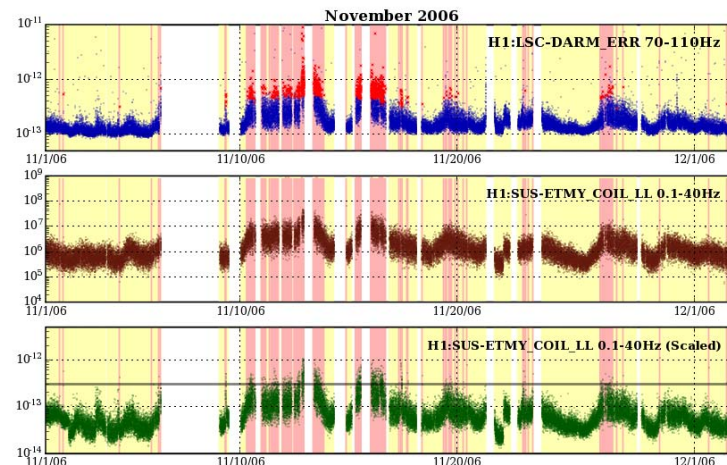
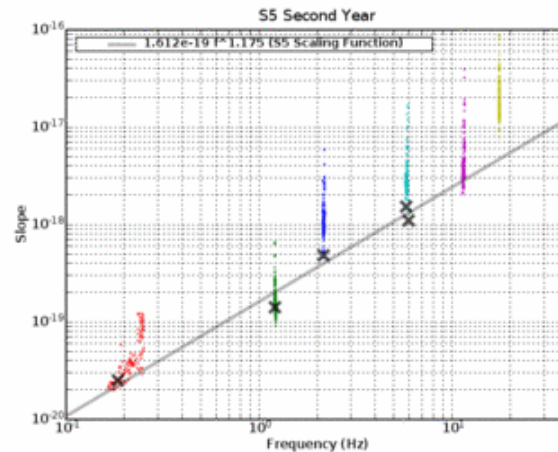
- Affects both LHO IFOs
  - » First noticed as coincident dips in inspiral range of H1 & H2
- Assumed to be caused by exchange of scattered light when there is a large relative motion of IFOs ( $>1\mu\text{m}$ )
- H1H2\_SCATTERING DQ flag based on out-of-band (1-4 Hz) DARM\_CTRL signal.
- No efficiency or safety tests have been made yet.





# Seismic Up-Conversion

- More general approach to H1-ETMY seismic up-conversion to 70-110Hz
- DQ flag generated by Masahiro from ETMY coil signal.
  - » Scale H1:SUS-ETMY\_COIL\_LL with f-dependent function.
  - » DQ flag indicates high 1% of scaled power in 0.1-40Hz band.
- Large overlap with existing flags – more sensitive?



# In Progress or Almost Finished

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- Overview of glitching in all optical lever lasers
  - » [http://www.ligo.caltech.edu/~jzweizig/S5\\_Data\\_Quality/oplev/oplev.html](http://www.ligo.caltech.edu/~jzweizig/S5_Data_Quality/oplev/oplev.html)
- Scan of eLogs.
- H2:XXX\_GLITCHINESS flags based on hand-scan of H2 epochs with large variation in inspiral range.
  - » [http://www.phys.lsu.edu/faculty/gonzalez/S5/H2BadSegs\\_AllS5](http://www.phys.lsu.edu/faculty/gonzalez/S5/H2BadSegs_AllS5)
- LLO Power Surges